

AMENDMENTS TO THE SPECIFICATION

Please replace the title beginning on page 1, line 4 with the following amended title:

BACKGROUND OF THE INVENTION

Please replace the title beginning on page 1, line 6 with the following amended title:

Technical Field of the Invention

Please replace the paragraph beginning on page 1, line 7 with the following amended paragraph:

~~The present invention relates to a method of manufacturing a semiconductor device, and more particularly, to a~~ A method of forming a dielectric film of a flash memory cell of a semiconductor device is disclosed.

Please replace the title beginning on page 2, line 6 with the following amended title:

SUMMARY OF THE INVENTION DISCLOSURE

Please replace the paragraph beginning on page 2, line 7 with the following amended paragraph:

Accordingly, ~~the present invention is contrived to substantially obviate one or more problems, due to limitations and disadvantages of the related art,~~ a method of manufacturing a semiconductor device is disclosed that can improve the roughness of the surface of the floating gate electrode using N₂O gas, prohibit concentration of an electric field on the surface of the gate electrode by improving characteristics of the dielectric film formed on the floating gate electrode, reduce the generation of the leakage current of the dielectric film, and improve the storage characteristic of the flash memory cell by increasing charge-to-breakdown and a breakdown region.

Please delete the paragraph beginning on page 2, line 9 as follows:

~~An object of the present invention is to provide a method of manufacturing a semiconductor device that can improve the roughness of the surface of the floating gate electrode using N_2O gas, prohibit concentration of the electric field on the surface of the gate electrode by improving characteristics of the dielectric film formed on the floating gate electrode, reduce generation of the leakage current of the dielectric film, and improve the storage characteristic of the flash memory cell by increasing charge to breakdown and a breakdown region.~~

Please replace the paragraph beginning on page 2, line 17 with the following amended paragraph:

Additional advantages, ~~objects,~~ and features of the invention disclosed method will be set forth in part in the description which follows and ~~in part~~ will become apparent to those having ordinary skill in the art ~~upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention may be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.~~

Please replace the paragraph beginning on page 2, line 24 with the following amended paragraph:

~~To achieve these objects and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, a~~ One disclosed method of manufacturing a semiconductor device ~~according to the present invention~~ is characterized in that it comprises ~~the steps of~~ providing a semiconductor substrate in which a floating gate electrode is formed, nitrifying the top of the floating gate electrode, forming a dielectric film along the step of the results, and forming a material film for a control gate electrode on the dielectric film, wherein the ~~step of~~ nitrifying the tope of the floating gate electrode and the ~~step of~~ forming the dielectric film are implemented in-situ within the same chamber.

Please amend the paragraph beginning on page 3, line 10 with the following amended paragraph:

In ~~another~~ an embodiment, a another disclosed method, ~~of manufacturing a semiconductor device according to the present invention is characterized in that it comprises the steps of the method comprises~~ loading a semiconductor substrate in which a floating gate electrode is formed into a deposition chamber, changing the temperature within the deposition chamber to a first deposition temperature, nitrifying the top of the floating gate electrode at the first deposition temperature, changing the temperature within the deposition chamber to a second deposition temperature range, sequentially depositing a first oxide film, a nitride film and a second oxide film along the step in the second deposition temperature range to form a dielectric film, and unloading the semiconductor substrate from the deposition chamber.

Please replace the paragraph beginning on page 3, line 21 with the following amended paragraph:

~~In another aspect of the present invention, it~~ It is to be understood that both the foregoing general description and the following detailed description ~~of the present invention~~ are exemplary and explanatory and are intended to provide further explanation of the ~~invention as claimed~~ methods.

Please replace the paragraph beginning on page 4, line 2 with the following amended paragraph:

The above and other ~~objects~~, features and advantages of the ~~present invention~~ disclosed methods will be apparent from the following detailed description of the preferred embodiments ~~of the invention~~ in conjunction with the accompanying drawings, ~~in which~~ wherein:

Please replace the paragraph beginning on page 4, line 7 with the following amended paragraph:

FIG. 1A ~ FIG. 1G are cross-sectional views of semiconductor devices for explaining a disclosed method ~~of manufacturing the device~~, and

Please replace the title beginning on page 4, line 12 with the following amended title:

DETAILED DESCRIPTION OF THE PRESENTLY
PREFERRED EMBODIMENTS

Please replace the paragraph beginning on page 4, line 13 with the following amended paragraph:

Reference will now be made in detail to the preferred embodiments, ~~of the present invention~~, examples of which are illustrated in the accompanying drawings, in which like reference numerals are used to identify the same or similar parts.

Please replace the paragraph beginning on page 4, line 17 with the following amended paragraph:

FIG. 1A ~ FIG. 1G are cross-sectional views of semiconductor devices for explaining ~~a method~~ disclosed methods of manufacturing ~~the device~~ semiconductor devices.

Please replace the paragraph beginning on page 7, line 4 with the following amended paragraph:

In order to improve an adhesive characteristic between an oxide film in a subsequent process and the trench 18 and prevent generation of a moat, HTO formed using DCS (dichloro silane; SiH_2Cl_2) gas is deposited in thickness of 50 ~ 150°C. A high temperature densification process is then implemented using N_2 at a temperature of 1000 ~ 1100°C for 20 ~ 30 minutes, thus forming a liner oxide film (not shown). As the density of the tissue of liner oxide film is ~~made-dense~~ increased by the high temperature densification process, it helps to increase the etch resistance, prohibit formation of a moat when implementing STI and prevent ~~the~~ leakage current.

Please replace the paragraph beginning on page 7, line 18 with the following amended paragraph:

After a planarization process using CMP is implemented, a post cleaning process using BOE or HF is implemented in order to remove ~~the~~ any oxide film that may remain on the pad nitride film 16. At this time, ~~it is required that~~ a reduction in the height of

the HDP oxide film 22 due to over-etch can be prohibited ~~by maximum~~. The HDP oxide film 22 buries the trench and the top of the HDP oxide film 22 ~~is protruded~~ protrudes above the polysilicon film 14. Thus, the HDP oxide film 22 serves as an isolation film for isolating the floating gate electrodes that are formed in a subsequent process.

Please replace the paragraph beginning on page 10, line 3 with the following amended paragraph:

After the annealing process using N_2O gas, the temperature of the chamber is lowered to $750^{\circ}C$ (D region in FIG. 2). A DCS (dichloro silane; SiH_2Cl_2) gas as a deposition gas is also introduced into the chamber under a low pressure of $0.1 \sim 3$ torr at a temperature of $790 \sim 830^{\circ}C$. The two gases are controlled so that the ratio of DCS and N_2O keeps in the range $1 : 5 \sim 1 : 10$, so that the first oxide film 34 is formed along the step of the entire structure (E region in FIG. 2). In the above, the first oxide film 34 is formed in thickness of $35 \sim 100\text{\AA}$ using hot temperature oxide.

Please replace the paragraph beginning on page 12, line 16 with the following amended paragraph:

As described above, ~~according to the present invention~~, after the floating gate is formed, a nitrification process is implemented to form a nitrification layer on the floating gate electrode. Therefore, the ~~present invention has new effects that it~~ disclosed methods can improve ~~a characteristic~~ the characteristics of the dielectric film, characteristics of a leakage current, a breakdown field and charge-to-breakdown, and the roughness of the surface of the floating gate electrode.

Please replace the paragraph beginning on page 12, line 22 with the following amended paragraph:

Also, the ~~present invention has a new effect that it~~ disclosed methods can simplify the manufacturing process since the nitrification process and the dielectric film formation process are implemented in-situ.

Please replace the paragraph beginning on page 13, line 1 with the following amended paragraph:

Furthermore, ~~the existing equipment and process are~~ can be employed with the disclosed methods without ~~using complex process or requiring new~~ equipment. Therefore, ~~the present invention has a new effect that it~~ disclosed methods can fabricate devices of a high reliability with at low cost.

Please replace the paragraph beginning on page 13, line 4 with the following amended paragraph:

The forgoing embodiments are merely exemplary and are not to be construed as limiting ~~the present invention of this disclosure~~. The present teachings can be readily applied to other types of apparatuses. The description of the ~~present invention~~ disclosed methods is intended to be illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art.